MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

MAX2053 – 3D SIMULATION

(All sections / Groups)

21 OCTOBER 2016
9.00 a.m. - 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 9 pages of simulated questions. Read them carefully.

2. This exam paper consists of TWO parts:

Part One: Multiple Choices	Answer **ALL** questions
Part Two: Essay Questions	Answer **THREE** out of FOUR

3. Simulate all your answers in the Answer Booklet. May the force be with you.

PART ONE: MULTIPLE CHOICE QUESTIONS

Answer ALL Questions in the Multiple Choice Answer Sheet.

1. Which particle render types listed below is a hardware based particle?

   A. Tubes
   B. Sprites
   C. Clouds
   D. Blobby Surface

2. Which attribute controls a dynamic field's area of effect?

   A. Attenuation
   B. Magnitude
   C. Max Distance
   D. Speed

3. Luis Figo wants to automatically create particles from contact points of rocks falling on a collision floor. What is the **BEST** tool for him to execute this effect?

   A. Use Particle Instancer with Collision editor
   B. Create an 'Emit from Object' particle emitter
   C. Create a particle emitter with the sprites wizard
   D. Use the Particle Collision Event editor

4. Which rigid body solver's method below portrays the correct level of accuracy?

   A. Midpoint = Least; Runge-Kutta = Medium; Runge-Kutta Adaptive = Best
   B. Midpoint = Best; Runge-Kutta = Medium; Runge-Kutta Adaptive = Least
   C. Runge-Kutta = Least; Midpoint = Medium; Runge-Kutta Adaptive = Best
   D. Runge-Kutta = Best; Midpoint = Medium; Runge-Kutta Adaptive = Least

5. Gabriel Batistuta wants to attach an existing smoke effects with a new gravity field. Which relevant editor would he use to complete the task?

   A. Dynamics Relationship Editor
   B. Dynamics Component Editor
   C. Dynamics Hypergraph Editor
   D. Attributes Connection Editor

Continued .....

6. What are the functions of *'Collision Layer'* in a rigid body simulation?

I. Collision objects can have multiple collision layer numbers
II. Collision layer objects will only react within the same layer.
III. Collision layer with the value of zero will affect all objects regardless of their layer number
IV. Collision layer with the value of zero will not affect any collision objects in the scene

A. I and II
B. I and III
C. II and III
D. II and IV

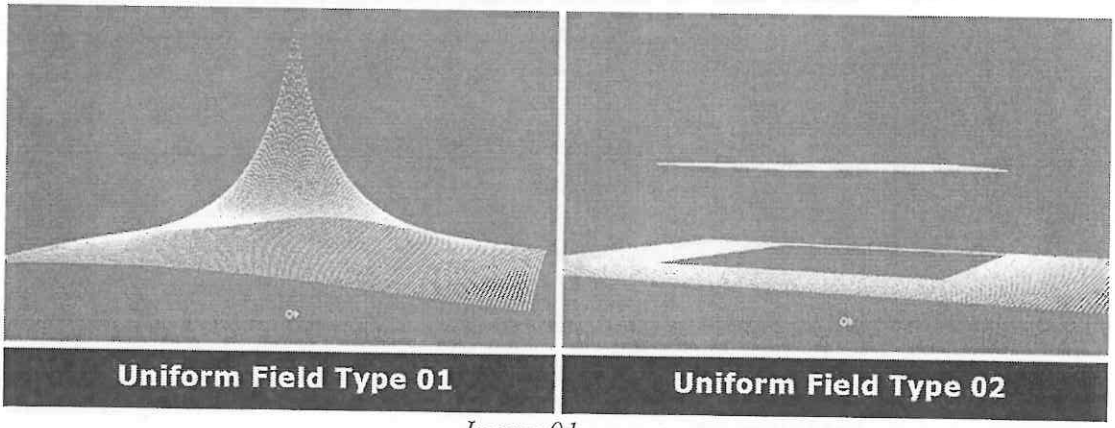

Image 01

7. *Image 01* shows two simulation results of a particle grid with a single uniform field (positive Y-axis direction) placed under it. Uniform Field Type 01 has a gradual fall-off result where else Uniform Field Type 02 has a distinctive cutoff. How would you achieve the effect similar to Uniform Field Type 02?

A. Use the Volume Shape proxy option
B. Turn on the Max Distance option
C. Decrease the attenuation value
D. Decrease the Fall-Off value to zero

Continued .....

8. Shevchenko wants to create a deformable ground using soft body dynamics. However the soft body floor does not stop deforming after collision. What can Shevchenko do to better control the deformation result?

   I. Decrease the conserve value
   II. Decrease the friction value
   III. Increase the resilience value
   IV. Increase the damping value

   A. I and II
   B. I and IV
   C. II and III
   D. III and IV

9. Paulo Maldini used the '*Particle Instancer*' to execute a group of futuristic cars flying through the skies, but the cars are flying sideways. Which attribute does he needs to change in order to achieve a proper effect?

   A. Aim Position > Change to World Velocity
   B. Rotation Type > Change to Velocity
   C. Aim Direction > Change to Velocity
   D. Aim Axis > Change to World Velocity

10. Which of the following statements are **FALSE** regarding the 'Conserve' attribute?

    I. Conserve allows the simulation system to retain all history of simulation fields that affected the object
    II. Conserve allows an object to regain its speed without external fields affecting the object
    III. Conserve does not affect simulated objects before a collision event
    IV. Conserve does not allow objects to lose its internal forces when it is affected by fields

    A. I, II and III
    B. I, II and IV
    C. II, III and IV
    D. All of the above

Continued .....

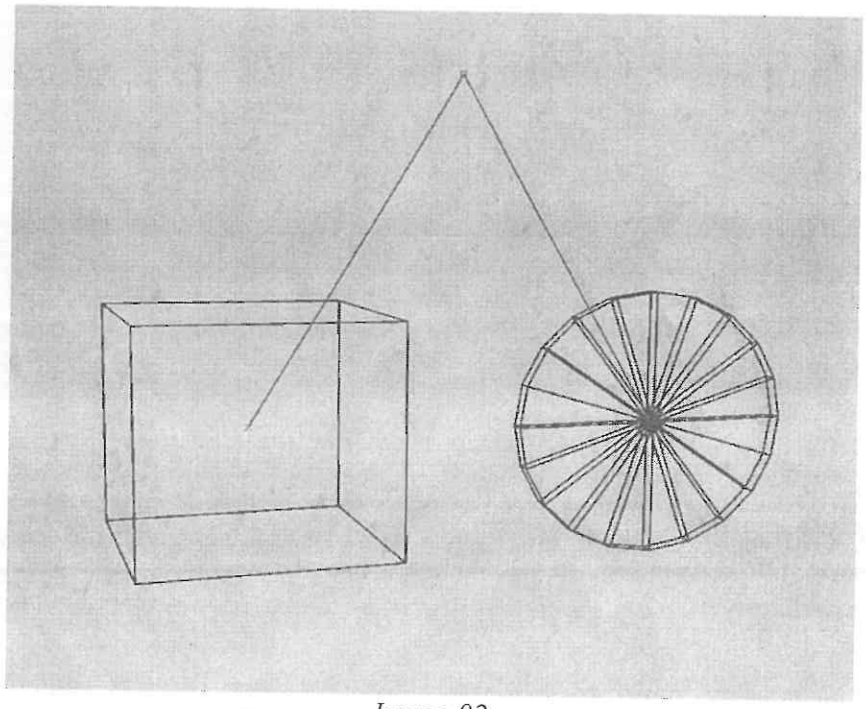

Image 02

11. *Image 02* displays a constraint commonly used in MAYA Rigid Body simulation. What type of constraint is it?

    A. Pin Constraint
    B. Nail Constraint
    C. Hinge Constraint
    D. Spring Constraint

12. Sometimes, a rigid body collision between two really close objects would penetrate and cause the simulation to malfunction. How can we improve the simulation and minimize object penetration during collisions?

    A. Increase the Scale Velocity and Tessellation Factor of the collision object
    B. Decrease the Scale Velocity and Tessellation Factor of the collision object
    C. Increase the Step Size and Collision Tolerance of the Rigid Solver
    D. Decrease the Step Size and Collision Tolerance of the Rigid Solver

Continued .....

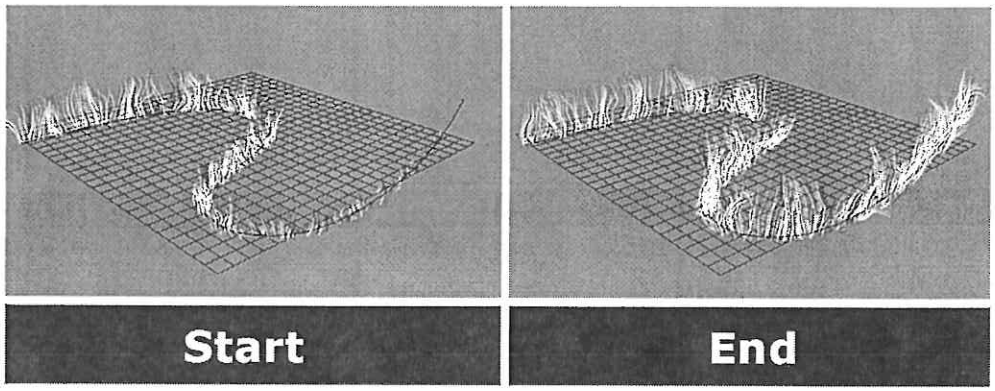

Image 03

13. *Image 03* above shows a Fire Paint Effects brush that is attached to a curve. The fire grows along the path from the start curve to the end curve as shown in the image. Which actions/options do you need to perform to mimic the result accordingly?

    A. Increase Flow Speed, Turn On Stroke Time, Turn On Time Clip
    B. Increase Flow Speed, Increase Surface Offset, Turn On Stroke Time
    C. Increase Tubes per Step, Increase Surface Offset, Turn On Time Clip
    D. Increase Tubes per Step, Turn On Stroke Time, Turn Off Time Clip

14. Which file naming structure below is most suitable for use as an animated texture for sprite particles?

    A. sprite-001.png
    B. sprite.001.png
    C. sprite_001.png
    D. sprite.png.001

15. The amount of particles emitted from an emitter depends on its Rate value. How does MAYA measure its particle's Rate value?

    A. Particles emitted per cycle
    B. Particles emitted per frame
    C. Particles emitted per second
    D. Particles emitted per distance

Continued .....

16. Which dynamic field below is suitable to create a sucking/magnetic effect?

A. Drag field
B. Radial field
C. Vortex field
D. Air field

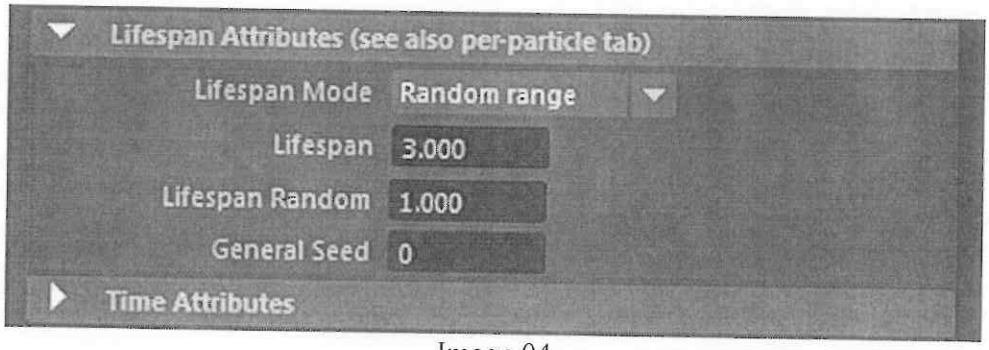

Image 04

17. K. Sambagamaran created a new *ParticleShape* with lifespan settings shown above for a PAL TV production. Based on these settings, which statements below are **TRUE**?

I. Increasing '*General Seed*' will reduce lifespan's randomization
II. All particles has a lifespan life of 3 seconds
III. Particles will begin to die after the 50th frame
IV. Increasing '*Lifespan Random*' value will improve randomization results.

A. I and II
B. II and III
C. II and IV
D. III and IV

18. Pavel Nedved had just created an *n*Hair dynamic setup from a polygonal surface. He realized that there were 3 new curves created together with his hair follicles. Which curves below are **NOT** a part of the *n*Hair dynamic system?

A. Start Curve
B. Contact Curve
C. Rest Curve
D. Current Curve

Continued .....

19. Which of these particle types are **NOT** available in the *n*Particle system?

I. Blobby Surface
II. Sprites
III. Balls
IV. Clouds

A. I and II
B. III and IV
C. I, II and IV
D. None Of The Above

20. How do you bake a rigid body simulation?

A. Go to Solvers > Timeline > Bake Simulation
B. Go to *n*Cache > Frame > Bake Simulation
C. Go to Edit > Keys > Bake Simulation
D. Go to Modify > Attributes > Bake Simulation

Continued .....

PART TWO: ESSAY QUESTIONS
Answer THREE of the following Four Questions. Give DIRECT answers.

Question 1

I. Explain **BRIEFLY** what is a 2D fluid container and a 3D fluid container. How would their differences affect a fluid effects production process?

(*4 marks*)

II. The *'Pond'* and *'Ocean'* fluid effects are part of MAYA's Open Water simulation system. Explain what they are and how they dynamically differ between each other? Draw wireframe example of a pond and an ocean to help explain your answers.

(*16 marks*)

Question 2

I. Give **FIVE** key comparisons between MAYA legacy particles versus MAYA *n*Particles?

(*10 marks*)

II. Shinji Nakamura is looking to create *'Attack Of The Killer Thousand Bugs'* effect where a swarm of crawling insects bursts through a kitchen floor and engulfs the whole room. Explain in detail the significant steps he needs to execute to create the effect using *n*Particles.

(*10 marks*)

Question 3

I. List down and explain the **MANY** differences between MAYA Rigid Body and the BULLET dynamic system?

(*10 marks*)

II. What is a Rigid Body Set, and what are the numerous benefits of using them during a BULLET simulation process?

(*10 marks*)

Continued .....

Question 4

I. Please provide **THREE** productivity methods to improve efficiency in any dynamic simulation process. Discuss briefly the reasoning behind those methods?

(6 marks)

II. F ill up the table below with the **BEST EFFICIENT** answers. Please recreate Table 01 in your answer booklet.

Effects	Dynamics System used	Key technique(s) used
Gun nozzle fire (example)	*Particle or nParticle simulation*	*Emitter with animated rate*
Face Melting effect		
Bottle Breaking effect		
Rocky Cliff Crumbling effect		
Paper Tearing effect		
Jelly Pudding Wobbling effect		
Realistic Tornado Effect		
Cereal filling up a bowl effect		

Table 01

(14 marks)

**Please check, re-check and triple-check your answers until the exam ends*

End of Paper.